such guidance one looks to Rothamsted, and the rapidity with which a second edition of Dr. Russell's little treatise on manuring has been called for is the best evidence of the success with which he has discharged his obligation. In the briefest compass he gives the clearest possible guidance to the practice of manuring, illustrated throughout by what is probably the most complete summary extant of the results of manurial experiments carried out in this country. The previous edition has been considerably amplified and a very brief chapter added on the breaking up of grassland.

SIR CLEMENTS MARKHAM.

The Life of Sir Clements R. Markham, K.C.B., F.R.S. By Admiral Sir A. H. Markham. Pp. xi+384. (London: John Murray, 1917.) Price 15*s*. net.

IT is not often that the story of a notable life is told by a biographer who is at once sympathetic and impartial. Admiral Sir Albert Markham, the author of the work under review, is not merely closely related to the subject of the memoir, but was his warm and constant friend. Yet he tells his story with the straight simplicity which seems specially to distinguish naval writers, and he leaves his readers to form their own conclusions. Therein lies the greatest charm of the book, for we can well construct for ourselves from the incidents of a life overflowing with energy and achievement the character of a man who enriched the world by many of those "footprints on the sands of time" which serve as indications and guides in the path of generations to come.

The opening chapters of the book are devoted to the career of young Clements whilst he served as cadet and midshipman in the Royal Navy. Incidentally, there is much interesting history of the gradual extension of our geographical knowledge of the Pacific towards the end of last century, and a very clear conception is given of life in a wooden-sided sailing-ship of the latest and smartest class which preceded the introduction of steam, just about the time when steam was beginning to assert a preponderating influence on naval construction. All this is told with the loving interest of a blue-water sailor, and it is easy to gather from the story how the foundations were then laid of that deep admiration and reverence for the Royal Navy which towards the end of Sir Clements Markham's career amounted almost to infatuation. In the sailor boy, too, we can mark the germs of the mature character of the man. Full of generous impulse, which landed him now and then in serious difficulty (as when he rushed headlong, without even the preliminary knock at the door, into the sacred precincts of his captain's cabin to protest against the flogging of a man who had been twice convicted of drunkenness), he finally decided to forsake a career of adventure which he really loved for the prosaic prospects of a life on land, because of a mistaken notion that discipline and fair play could not be reconciled. His persistent adherence to that decision, from which no persuasions of his family and many friends could shake him, was quite characteristic of his subsequent attitude in circumstances which occurred not infrequently when his opinions on more important matters were questioned by those who worked with him in the interests of scientific geography. The word "obstinate" has occasionally been whispered of him; but it is not always easy to say where the line is to be drawn between the firmness which may be essential to the successful issue of an important scheme and the unyielding attitude of the autocrat.

Undoubtedly Sir Clements was able, by reason of his determination and his forceful character, to carry through schemes for exploration in regions of the world where no economic gain could be expected in return for great expenditure, and the whole object of research was purely scientific, which would never have matured in the hands of a more feeble advocate. There are some thrilling accounts of Arctic adventure in the book, which is, perhaps, most interesting in these earlier chapters devoted to the moulding of the Markham character.

The author succeeds in carrying our sympathies with his subject from his earliest years of adventure in the fields of exploration and literature (the young Clements wrote a book on astronomy and physical geography at the age of thirteen!) until the pitiful tragedy of his death occurred, without ever drawing on any idealistic resources of his own. Full justice is done to the noble qualities of the man. His warm-hearted enthusiasm for the supremacy of his country in the wide field of exploration, and his devotion to historical and geographical literature which resulted in the publication of much valuable information which might otherwise have been lost to the world, are easily to be gathered from the pages of this biography. His kindly nature (which won him hosts of friends), his ready assistance to those who wanted it; his life-long interest in all that might benefit humanity, which included the acquisition for England of that life-giving remedy for tropical fevers, cinchona, after a difficult and perhaps dangerous quest for the seeds and plants in Peru—all these things combined to illustrate a character which is perhaps unique in these days, and fully deserves the permanent record which has been so ably rendered by Admiral Sir Albert Markham.

As a rule, biographies written by relatives are accepted with a certain amount of justifiable suspicion. There need be no such suspicion in this case. No one who had the privilege of friendship with the subject of these memoirs will say that there is a word too much of uncalled-for adulation. It is a fair record all through and a most interesting story.

T. H. H.

OUR BOOKSHELF.

Food Poisoning. By Edwin O. Jordan. Pp. viii+115. (Chicago, Ill.: University of Chicago Press; London: Cambridge University Press, 1917.) Price 1 dollar or 4*s*. net.

THIS little book gives an excellent summary of the subject of food poisoning. It is not within its scope to consider those cases in which definite poisonous substances are added to food with

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criminal intent. The term "food poisoning" is here limited to the occasional cases of poisoning from organic poisons present in normal animal or plant tissues, the more or less injurious consequences following the consumption of food into which formed mineral or organic poisons have been introduced by accident or with intent to improve appearances or keeping quality, the cases of infection due to the swallowing of bacteria and other parasites which infest or contaminate certain foods, and the poisoning due to deleterious substances produced in food by the growth of bacteria, moulds, and similar organisms. We have no certain statistics of the frequency of food poisoning, but Mr. Jordan has collected data of more than 1000 cases occurring in the United States in the two years October, 1913, to October, 1915.

In the chapter dealing with poisonous plants the poisonous fungi claim most attention. Some reference might have been made to the nutmeg, which is distinctly toxic in large doses, and in smaller doses to some individuals. In the section dealing with food-borne, disease-producing bacteria, the sub-heading is "Paratyphoid Infection," and this term is used many times. What is really meant is Gärtner (*B. enteritidis*) infection, and this organism is distinct from the paratyphoid bacilli, though belonging to the same group. Ptomaine poisoning is too briefly referred to, and we note the omission of all allusion to tyrotoxicon, which is somewhat surprising. One of the best sections is that dealing with food preservatives, to which several pages are devoted. In conclusion, reference is made to such conditions as beri-beri, pellagra, lathyrism, scurvy, etc. The book is well produced, very readable, and illustrated with several figures. R. T. H.

Adolescence. By Stephen Paget. Pp. 59. (London: Constable and Co., Ltd., 1917.) Price 7*d*. net.

In the adolescent mind ideas of sex and religious ideas often grow up together, and they should be correlated. While there is a wide range of individual peculiarity within the limits of the normal, there is no virtue in a child's being incurious. Careful preparation should be made by parents and teachers so as to give well-considered and honest answers to embarrassing questions. Perhaps there should be a home-ceremony or an initiation, " the whole thing well thought out, the exhortation written down beforehand, every word of it." " First-rate school teachers are more likely than second-rate parents to say the right thing to children." " The reasonable soul and flesh is one man," and there must be disciplining of both sides. " If I could be a young man again, I would get on without alcohol and cigarettes. . . . Let me, as a doctor, add a good tonic to steady the nerves of adolescence. I prescribe a full dose of the natural sciences." " What does harm the minds of children is not our plain speaking; it is their own secret reading, gossiping, and imagining." "And—so far as adolescence is concerned —if ever there was a time when we ought to speak plainly, it is now."

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Sources of Potash.

SIR EDWARD THORPE'S lucid review of the known geological sources of potash (NATURE, January 3) is of absorbing interest to agriculturists, whose industry must be seriously affected by any permanent stinting in the supply of this indispensable fertiliser, entailing a corresponding diminution in the production of root crops. They might, however, tide over a temporary shortage of potash by availing themselves of a subsidiary source.

The Boards of Agriculture for England and Scotland having recently issued leaflets directing attention to the high percentage of potash contained in bracken fern, Prof. H. G. Greenish, director of the Pharmacy Research Laboratory in Bloomsbury Square, very kindly undertook at my request to make analysis of the ash of incinerated bracken. As it had been stated that the amount of potash contained in the fern cut in autumn showed a considerable diminution compared with that cut at midsummer, I sent Prof. Greenish three consignments, cut respectively in July, September, and, after the plant had withered, in November. The result proved practically the same in each case, and I may quote as follows from Prof. Greenish's very full report:—

" I find that the fern, when dried in a warm room and *completely* burnt to a nearly white ash, yields 4·82 per cent. of ash. This ash contains 41·5 per cent. of potash, K_2O. The dried fern itself would therefore yield 2 per cent. of potash, or 50 tons of fern would yield about 2·41 tons of ash, in which there would be about one ton of potash. . . . In addition to the potash the ash contains small quantities of soda, phosphates, sulphates, and chlorides."

It is clear from this that, although bracken can never compete with geological deposits as a source of potash, a considerable amount might be recovered by harvesting and burning the fern under a proper system. At the same time, it would tend to rid the land of a pest which has destroyed much of the best hill pasture in the North, and is spreading year by year. Bracken will grow only on good land; it cannot thrive on marsh. The destruction of pasture is far from being the only evil; animals feeding among bracken get their heads and necks covered with ticks—in fact, the death of a considerable number of sheep in this county seems to be justly attributed to this cause alone. If, therefore, land can be cleared of a most pernicious weed, and, at the same time, a valuable manure obtained for tillage, there are many farms where the work might be profitably undertaken.

The analogy of kelp presents itself. I understand that it takes from twenty to twenty-two tons of good wet seaweed to produce a ton of kelp, which yields between 30 and 40 per cent. of potassium salts, more than double the return from an equal weight of dried fern, besides the iodine which is recovered from kelp. But, on the other hand, it is far easier to cut bracken than to gather deep-sea tangle, and the ash can be used as a fertiliser on the farm where it is burnt.

Driving lately from Dorchester to Abbotsbury, I saw hundreds of acres of downland rendered absolutely valueless by bracken, whereof the luxuriant growth betokened a soil well adapted either for tillage or forestry. HERBERT MAXWELL.

Monreith, Whauphill, Wigtownshire, N.B.

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